

The Data Clinic: a service to improve access to data for QI

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What we learnt

- › No two projects are alike: a flexible approach to data requesting saves time and increases productivity
- › To understand data quality, we must understand the working lives of those who create the data
- › Mutual accountability improves the work of those translating queries, and those collecting data

Overview

- Access to data limits QI projects
- Data can be extracted from clinical databases, but misunderstanding limits learning
- We used data-minded clinicians to translate clinical queries into code
- This ‘Data Clinic’ approach has allowed faster access to greater amounts of data
- Data quality limits utility of further work, such as self-service analytics.

Background

Organisations which have a culture of data-driven decision-making are typically more effective than those which do not.¹ University College London Hospital’s ICU is one of the largest and most complex in the UK, and we are aiming to be leaders in Quality Improvement, as well as data-driven care.

We have an advanced information landscape, including a state-of-the-art, integrated, and comprehensive EHRs.² This is an ideal platform from which to deliver data-driven insights, and one we are not capitalising on.

A significant number of QI projects fail, and many of these fail due to issues of data collection.³ It is clear that access to data needs to improve: faster, more, and better quality. In the UK, data collection for QI frequently relies on the work of junior colleagues laboriously hand collating in spreadsheets.⁴ More recently, with the advent of EHRs this work has been contracted to Business Intelligence teams who automate the extraction from back-end databases.⁵ Other centres have explored the capabilities of self-service analytics to allow clinicians to gain insights from data.

These systems are time-consuming, resource intensive, and frequently miss the point: the service lacks the clinician’s touch of designing data products for clinical questions.

We designed a service through which clinicians could request data extracts to ensure faster access to data, for those who need it most. Through collaboration between BI teams and clinicians with knowledge of data infrastructure, we developed a ‘Data Clinic’ for clinicians to request data products. Utilising dual understanding of clinical and technical queries our service strengthens the methodology of QI projects, and provides them with better quality data; more of it and faster.

Intervention

Within our local QI department, we identified clinicians with an interest in data science. Through a modified project registration form, we invited projects to request data. Our ‘Data Clinicians’ met with them to define their requirements, including project aims, inclusion/exclusion criteria, and precise metric definitions.

Figure 1. Our clinic process diagram. Investigators were invited to ask for data from data clinicians, who then met to translate clinical queries into discreet, testable queries. The data clinicians then worked with analysts from our BI team, translating further to code. Data were delivered, and analytics used to offer greater insights from our data. Frequently this cycle was repeated for the same project, as new requirements were revealed by analysis.

Data Clinicians and analysts in the BI team then wrote SQL code to extract data from our EHR’s backend databases. Data were provided in a variety of media, including csv files, Excel workbooks and regularly updated dashboards, depending on project requirements. Support was given to projects to allow maximum learning from what were often large datasets. This included basic analysis as well as programmatic insights using RStudio.

Learning

Our process was flexible, and was developed iteratively as part of several PDSA cycles, based on feedback from all stakeholders. In meeting with investigators, we found three questions must be asked:

- What is the clinical context? (What is the problem we are trying to solve?)
- What is the methodology context? (How should you answer your question?)
- What data are needed to answer the question? (Where are they? What are the data quality issues?)

These questions allow the right data to be provided, and maximise the learning from data delivered. They highlight the benefit of a ‘Data Clinician’ translating from clinical to database-friendly questions.

We aimed in this project to provide more data, faster. In seven projects we provided data for, we achieved a median time of 26 days from request to delivery. We delivered an average of 3,400 patient observations of 32 variables, or metrics, for each project.

Feedback collected has been overwhelmingly positive. Surprising learning included the unseen benefit to project robustness provided by our Data Clinic: the process of defining questions and metrics meant projects had to be broken down before they ever saw data.

What this reveals about our project, is that methodology support must come before data support. To be able to define a clinical query as something discreet and testable, one must be clear and deliberate with a project’s aims. Although data will always be needed, it is much easier to increase the value of a QI project in the planning stage, than in the collection phase. People and planning must come before data.

References

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What you can learn

- › Projects must be ready for the data you deliver: QI methodology support needs to come before data delivery
- › Sometimes data isn’t needed at all. Support must be directed to those projects likely to benefit
- › Registration and request forms are barriers: prioritise accessibility, and invest time in in-person meetings